Math 1552, Integral Calculus
Section 4.5: L'Hopital's Rule

Evaluate the following limits using L'Hopital's Rule.

1. $\lim_{x\to 0}\left[\frac{1}{x} - \cot x\right]$

2. $\lim_{x\to 0^+}[x(\ln(x))^2]$

3. $\lim_{x\to\infty}(x + e^x)^{2/x}$

4. $\lim_{x\to\frac{\pi}{2}}\left[\frac{\ln(\sin x)}{(\pi-2x)^2}\right]$

5. Find values of a and b so that

$$\lim_{x\to 0}\frac{\cos(ax) - b}{2x^2} = -4.$$